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**NATIONAL LEAD COMPANY**
OF OHIO
P. O. BOX 158, MT. HEALTHY STATION
CINCINNATI 31, OHIO

December 9, 1955

SUBJECT TRIP REPORT TO UTICA METALS DIVISION OF THE UTICA DROP FORGE & TOOL CORP.

TO F.L. Cuthbert

FROM Herbert Davis

REFERENCE

OBJECTIVE OF TRIP

This visit was made to observe the physical equipment and the personnel at Utica Metals Division as a possible source for development work in vacuum melting and casting.

CONCLUSIONS AND RECOMMENDATIONS

The prime business of this Division of the Utica Drop Forge & Tool Corp. is the production of ingots and fabricated shapes from high temperature alloys for the aircraft, automotive and electronics industries.

This Company has no apparent interest in development work but would be interested in providing facilities for a long range production program. The Company has adequate personnel and equipment to cast uranium metal into ingots and centrifugally cast rings. They do not have rolling or fabricating equipment. This type work is done by outside contractors.

We were informed that the present equipment has a full production schedule for the next twelve months.

The physical layout of the plant is such that it would be difficult to isolate one furnace for experimental work.

Only one member of the organization has a "Q" clearance.

It would be of interest to develop the possibility of casting a ring-type ingot from uranium metal. Dr. Darmara is going to submit some data on this type of ingot for high temperature alloys. From these data we will attempt to develop the possible economic feasibility of this type of uranium casting.

The writer would not be in a position to make any recommendations since this Company is only interested in production work.

MATERIAL

1-1110

BACKGROUND FOR TRIP

The Utica Metals Division contacted the AEC and proposed that they be considered for some of the experimental and production work that is now going on in this field. This trip is a follow up on that request.

PERSONS VISITED

Dr. F. Darmara, Vice President in Charge of Operations, J.K. Norris, Business Manager of Division, and H. Hamjan, Manager of Operations.

DESCRIPTION OF TRIP

Dr. Darmara escorted me through the laboratory, melting shop, and finishing departments. A good description of some of the equipment and operations is given in the appended folder. The laboratory is well equipped for spectrographic and wet chemical analysis. They have two separate spectrographic equipments. One of these is self recording. They also have two large research-type Bosch and Lomb metallographic microscopes with cameras. They have 72 high temperature stress rupture testing machines, housed in a separate laboratory. The balance of the chemical and physical laboratory equipment is conventional.

The Utica Metals Division employs approximately 80 people, about 30 of whom are used for direct labor. It occupies about 10,000 square feet of floor space in old buildings. Straight line flow of materials is somewhat hindered by the adaption to the old buildings. The melting and casting equipment is situated in one bay. It should be extremely difficult to isolate one unit for experimental work.

The metal melting department is equipped with four Stokes-type vacuum-induction melting furnaces. Two of these furnaces are capable of pouring melts of 1300 pounds of steel, one furnace pours 300 pounds, and a small furnace pours 100 pounds of steel. The vacuum equipment and the instrumentation is adequate and comparable to that of NLO. The furnaces differ in that the four of them are designed for lip pouring. For pouring a multiple of ingots from one melt, a rotary table with an indexing system is used. Each of the 1000 pound furnaces is equipped with a horizontal axis centrifugal casting machine. These machines have been used for casting rings four feet in diameter and weighing 1000 pounds.

The finishing department is equipped with saws, grinders, furnaces, and centerless grinding equipment. They do not have any facilities for fabrication of finished shapes. They rough turn some of the centrifugally cast rings. These rings are then cut, straightened, and rolled to bars and shapes by subcontractors.

They were equipped with Zyglo and pickling facilities. They do not have any non-distructive testing equipment but have access to a Sonotest through one of their contract fabricators.

MISCELLANEOUS COMMENTS

This plant is apparently well managed with adequate technical personnel for high vacuum melting operations. They are interested in establishing a second division of this Company, of comparable size to the one described, for production of uranium or rare metal ingots or centrifugal castings for the Atomic Energy program.

We advised Dr. Darmara to visit the Nuclear Engineering Science Congress in Cleveland next week. He will be there on December 14 and 15.

The possibilities of centrifugally casting a ring-type ingot is interesting from the standpoints that directional solidification could be obtained, thus promoting soundness, and quick freezing would provide a small grain size. There is no doubt that such a casting would require some conditioning.

A neat feat is performed in taking a preliminary test from the vacuum melt through a vacuum lock, getting spectroscopic chemical analyses and then making the indicated additions through chutes in a vacuum lock.

COMMITMENTS

None

Herbert Davis

Herbert Davis

HD/rk

Attachment

cc: G.W. Wunder (2) w/attach.
C.E. Polson w/attach.
Central Files w/attach.